C-A OPERATIONS PROCEDURE MANUAL

C-A TPL 04-09 TEMPORARY PROCEDURE TO ENSURE COMPLIANCE WITH THE NSRL ENERGY-FLUX ASE

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Hand Processed Changes

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Reviewed by:_____ _____
Date

Approved by:_____ _____
Assoc. Chairman for ESHQ Date

P. Ingrassia

C-A TPL 04-09 TEMPORARY PROCEDURE TO ENSURE COMPLIANCE WITH THE NSRL ENERGY-FLUX ASE

1. Purpose

1.1 The purpose of this procedure is to provide instructions to MCR staff to limit particle energy-flux during NSRL operations in order to comply with the Beam Intensity Operational Safety Limits (OSL) found in C-A OPM 2.5.3 NSRL Accelerator Safety Envelope Parameters.

The Beam Intensity Operational Safety Limits are:

1.1.1 The annual limit on the (product of) number and energy of nucleons extracted from the NSRL SEB system shall not exceed 10^{17} GeVnucleons.

1.1.2 The annual limit on the (product of) number and energy of nucleons deposited on the NSRL beam dump shall not exceed $3x10^{16}$ GeVnucleons.

1.1.3 The hourly limit on the (product of) number and energy of nucleons extracted from the NSRL SEB system shall not exceed $6x10^{14}$ GeVnucleons.

1.1.4 The hourly limit on the (product of) number and energy of nucleons entering the NSRL target room and beam stop system shall not exceed $6x10^{14}$ GeVnucleons

1.2 This procedure replaces TPL 04-02 and HPC 04-01

2. Responsibilities

2.1 The Operations Coordinator is responsible for the execution of this procedure.
2.2 MCR Operators are responsible for monitoring the Alarm Display Task (ADT).
2.3 The MCR Group Leader, or his designate, is responsible to check periodically that "good" data is being saved.
2.4 The operator responsible for NSRL OSL reporting shall ensure the database contains accurate data, maintain the NSRL_ASE Gpm application, and maintain the R line ion chamber logger application.
2.5 The Liaison Physicist (LP) is responsible for explaining to the users the necessity for periodic checks of beam transport efficiency and for ensuring that the 302 ion chamber cannot be retracted out of the beam.

3. Prerequisites

3.1 The JEFFSTATS server or equivalent application server must be running to generate GPM alarms.
3.2 The NSRL_ASE GPM is operational
3.3 The Ion chamber at 302 feet in the beam line is always inserted into the beam.
3.4 The Ion chamber at 302 feet in the NSRL beam line is calibrated.
3.5 Alarm Display (AGS) must be running to display GPM alarms.
3.6 A logger is running and logging the R line ion chambers
3.7 The target group for this procedure is the MCR Operators and Operations Coordinators (OC), the MCR Group Leader, and the NSRL Liaison Physicist.
3.8 The training requirement for this procedure is read and sign.
3.9 The minimum number of staff members that need to be trained in order for this procedure to be effective is three, one OC and one operator and the NSRL LP

4. Precautions

4.1 None

5. Procedure

5.1 Required software tools

5.1.1 Verify that JEFFSTATS server, ADT, and the watchdog /GPM/Jeff/NSRL_ASE.mon are running whenever NSRL is running.

5.1.2 The MCR Group Leader (MCRGL) or his designee shall periodically verify that good data is being saved.

5.1.2.1 IF good data is not being saved the MCRGL shall see that the situation is corrected within one day and shall estimate the impact of the error on the total counts used to monitor the hourly and yearly limits stated in paragraph 1.1

5.1.3 Daily, the DAY SHIFT OC shall look at a NSRL_ASE GPM display on a video monitor to verify that the application is using the correct ion species and energy for its accounting.

5.2 Required Instrumentation

5.2.1 The R line ion chamber at 302 feet must be inserted all the time. The dump ion chamber must be operational for use as backup in the event that the 302 ion chamber fails.

WARNING:
IF the 302 ion chamber fails, THEN the Liaison Physicist or his designee will determine how long the program may continue or what alternative means will be used in order to continue monitoring the number of particles that contribute to the hourly and yearly NSRL ASE limits

5.2.1.1 The NSRL liaison physicist shall put a yellow do not operate tag on the local controls for the ion chamber insert/retract drive after the chamber is inserted.

5.2.1.2 The liaison physicist shall state on the do not operate tag the conditions under which the drive may be operated and who may operate the drive.

5.2.1.3 The NSRL liaison physicist (LP) shall provide calibrations for NSRL Ion Chambers to the MCRGL or his designee.

5.2.1.3.1 Toggle switches to change IC gains will be posted with a sign that tells users to contact MCR before changing gains.

5.2.1.3.4.1 Gain Changes must be approved by the LP

5.2.1.3.4.2 The MCRGL or his designee must be informed of gain changes.

5.3 NSRL Operation

WARNING:
IF NONE OF THE CURRENT MEASURING INSTRUMENTS (BOOSTER CURRENT TRANSFORMER, and IC 302 IN R LINE) ARE CALIBRATED AND OPERATIONAL, AND D6 SEPTUM POWER SUPPLY IS ON THEN SETUP OF THE BOOSTER WITH BEAM MAY PROCEED ONLY IF THE RF IS TURNED OFF EARLY AND THE BEAM PREVENTED FROM REACHING THE EXTRACTION FLATTOP OF THE MAGNET CYCLE

5.3.1 Hourly Limits

Note 1:
IF 50% of the hourly limit for a parameter is exceeded, THEN a level III alarm will appear on the AGS ADT display. These alarms serve as a warning. The alarms are: JEF.NSRL_EXTR_HRLY_TOT range error (for NSRL Extraction and) JEF.NSRL_TGT_RM_HRLY_TOT range error (for the NSRL Target Room)

5.3.1.1 IF you see a level IV JEF.NSRL_EXTR_HRLY_TOT range error alarm on the ADT, THEN 90% of the hourly limit for NSRL extraction has been exceeded.

5.3.1.1.1 Verify, by looking at the NSRL_ASE gpm that the level causing the alarm is not >> 100% of the hourly limit. IF the level causing the alarm is >>100% of the hourly limit, then go to paragraph 5.3.3.

5.3.1.1.2 The OC shall inform the NSRL Liaison Physicist and curtail the program if instructed to do so.

5.3.1.2 IF you see a level IV JEF.NSRL_TGT_RM_HRLY_TOT range error alarm on the ADT, THEN 90% of the hourly limit for beam in the NSRL target room has been exceeded.

5.3.1.2.1 Verify, by looking at the NSRL_ASE gpm that the level causing the alarm is not >> 100% of the hourly limit. IF the level causing the alarm is >>100% of the hourly limit, then go to paragraph 5.3.3.

5.3.1.2.2 The OC shall inform the NSRL Liaison Physicist and curtail the program if instructed to do so.

5.3.2 Yearly Limits

Note 2:
NO 50% ALARMS WILL BE GENERATED FOR YEARLY PARAMETER LIMITS

5.3.2.1 IF you see a level IV JEF.NSRL_EXTR_YTD_TOT range error alarm on the ADT, THEN 90% of the YEARLY limit for NSRL extraction has been exceeded.

5.3.2.1.1 Verify, by looking at the NSRL_ASE gpm that the level causing the alarm is not >> 100% of the yearly limit. IF the level causing the alarm is >>100% of the yearly limit, then go to paragraph 5.3.3.

5.3.2.1.2 The OC shall inform the NSRL Liaison Physicist and curtail or stop the program if instructed to do so.

5.3.2.2 IF you see a level IV JEF.NSRL_BM_SP_YTD_TOT range error alarm on the ADT, THEN 90% of the YEARLY limit for beam in the NSRL beam stop has been exceeded.

5.3.2.2.1 Verify, by looking at the NSRL_ASE gpm that the level causing the alarm is not >> 100% of the yearly limit. IF the level causing the alarm is >>100% of the yearly limit, then go to paragraph 5.3.3.

5.3.2.2.2 The OC shall inform the NSRL Liaison Physicist and curtail or stop the program if instructed to do so.

5.3.3 Problems with the NSRL_ASE GPM

Note 3:
"Non-physical" measurements may add incorrect data to the integrated total which operations uses to regulate the amount of beam dumped and stay under OSLs outlined in this procedure. In order to stay in compliance with this procedure, calculation of the beam that was extracted prior to the incorrect data point must be made, and then added to that calculated after the integration has been reset by stopping and starting the gpm. By observing a plot of the TtB transformer at extraction for the last hour, one can calculate NSRL extracted beam totals and therefore correct the non-physical measurements.

5.3.3.1 IF an incorrect data point is observed THEN:

Note 4: Be sure the arithmetic is done in the same (nucleon) units

5.3.3.1.1 Calculate the last hour's NSRL extracted beam by integrating points using the NSRL_ASE logger (LogView)

5.3.3.1.2 Use these as representative hourly totals and follow this procedure

5.3.3.1.3 Stop and start NSRL_ASE gpm, which will reset the totals

5.3.3.1.4 After 20 minutes of running, recalculate the old total for 40 minutes and add this to the newly integrated totals

5.3.3.1.5 Use these new numbers as representative hourly totals to be respected by this procedure

5.3.3.1.6 Repeat 5.3.3.1.4 and 5.3.3.1.5 above, subtracting 20 minutes from the old total each time, and adding 20 minutes to the new total each time until an hour has passed

5.3.3.1.7 After an hour has passed, respond to dumped beam totals as displayed by NSRL_ASE.

5.3.3.1.8 IF the (hourly) data needs correcting, THEN the MCRGL shall also ask the operator who maintains the data to correct the database so that the yearly data is accurate.

5.4 Control of Losses in the beam transport.

5.4.1 The Liaison Physicist shall explain to the users the need for periodic checking of the beam transport efficiency

5.4.2 The NSRL operator shall check the beam transport efficiency at the start of the day, and every four hours "while operating" thereafter.

5.4.3 The NSRL operator shall check the transport efficiency by inserting the R63 ion chamber, or the upstream most functioning ion chamber and by measuring the transmission to the 302 ion chamber. IF the transmission is not 90% or better, THEN the operator shall tune the beam or ask the Liaison Physicist for assistance.

5.4.3.1 Notification shall be given to the experimenters before an upstream ion chamber is inserted.

6. Documentation

6.1 None.

7. References:

7.1 C-A OPM 2.5.3 "NSRL Accelerator Safety Envelope Parameters"

8. Attachments:

8.1 None